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DEPARTMENT OF STATE LANDS

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P.O. BOX 201601
STATE OF MONTANA
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October 7, 1993

Dear Reader:

Enclosed for your review is an Environmental Assessment (EA) prepared by the Department of State Lands (DSL). The EA evaluates a proposal by Continental Lime, Inc. for expansion of mining south into the Limestone Hills.

Public comment on this EA will be received by DSL until 5:00 p.m. October 29, 1993. Comments should be about the adequacy of the EA in assessing issues, new information not considered that may influence the analysis, and clarification. Comments should be specific. The DSL will use these comments and agency responses, the EA, and the application to make a final decision on the permit. The decision may be to approve the proposal, deny the proposal, or approve the proposal with modifications.

Comments will be accepted by calling Bob Winegar (444-2074), or written comments directed to:

Bob Winegar
Department of State Lands
PO Box 201601
Helena, MT 59601-1601

Thank you for your time and consideration. Please call Dept. of State Lands (444-2074) if you have any questions.

Sincerely,

Bob Winegar

Robert C. Winegar
Program Supervisor
Hard Rock Bureau
Reclamation Division

/etc

enclosure

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ENVIRONMENTAL ASSESSMENT

for

CONTINENTAL LIME, INC.
APPLICATION FOR LIFE-OF-MINE-EXPANSION AMENDMENT TO
DEPARTMENT OF STATE LANDS OPERATING PERMIT 00105

PREPARED BY:

DEPARTMENT OF STATE LANDS
HARD ROCK BUREAU
HELENA, MONTANA

PURSUANT TO THE
MONTANA ENVIRONMENTAL POLICY ACTS

OCTOBER 8, 1993

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CHAPTER I - INTRODUCTION

A. Proposed Action

On October 15, 1992, the Montana Department of State Lands (DSL) and the Bureau of Land Management (BLM) received an application from Continental Lime, Inc. (CLI) to expand the acreage under DSL Operating Permit 00105 at their Indian Creek lime plant located near Townsend, Montana (CLI, 1993). CLI produces quicklime and hydrated lime for use in base and precious metal processing, plastics, paper, and air pollution control. The purpose of the amendment application would be to allow for the development and extraction of 30-50 years worth of minable limestone reserves. This application for amendment is called the "Life-of-Mine" amendment (LOM). New disturbances would include a pit expansion, expansion of the existing reject fines dump, the construction of new waste rock dumps, and the construction of access and haul roads. Existing disturbances would remain and they include: unreclaimed quarry pits, soil stockpiles, waste rock dumps, a mill site, and a kiln dust depository.

B. Purpose and Need for Action

The application for this expansion was submitted to the DSL pursuant to the Metal Mine Reclamation Act, Part 3, Chapter 4, Title 82, Montana Code Annotated (MCA), and to the BLM pursuant to 43 CFR 3809. State and Federal statutes, the Montana Environmental Policy Act (MEPA) and the National Environmental Policy Act (NEPA), require an environmental analysis be performed to determine if any significant environmental impact results from the proposed action. Presence of significant environmental impact would indicate an Environmental Impact Statement (EIS) would have to be completed for the project. This Environmental Assessment (EA) document is the written findings of the agencies' analysis.

The National Environmental Policy Act and the Montana Environmental Policy Act are Federal and State laws which also direct the BLM, DSL and DHES to identify and disclose effects of proposed activities on Federal and State lands to the public and officials making decisions concerning the proposal. Under NEPA and MEPA, issues and alternatives are developed based on both public and agency input gathered during scoping. These issues are then tracked through the environmental analysis phase of the document or dismissed if the problem is irrelevant or minor.

The deciding officials review the alternatives and weigh the opportunities, tradeoffs, positive and negative impacts, and come to a decision. All BLM decisions concerning mining plans of operations can be appealed under Federal appeal regulations (43 CFR 4.400). State decisions can be challenged in district court for a period of 90 days after the permit.

C. Background and Project Location

CLI's Montana mine and plant facilities are located in Sec 33, T7N, R1E, on private and BLM lands approximately 4 miles northwest of Townsend in Broadwater County (Figure 1). Employment at the mine and processing plant varies from 40-56 individuals.

Continental Lime, Inc. received an initial permit June 26, 1981, for 354 permit acres, of which 61 acres would be disturbed. The effects of this action were evaluated in an environmental review (DSL, 1981). The mine plan identified 10 ore blocks (A thru J) for development. A later amendment deleted blocks B thru G, and parts of H and J in 1985. Subsequent amendments repermitted blocks D thru H, and a second kiln was added at the plant site in 1990 (DSL, 1988, 1990). An additional 12 acres were permitted in August of 1993 in order to access and develop reserves in the B and C blocks, thereby bringing the total permitted acreage to 315 acres, 145 of which are disturbed (BLM and DSL, 1993). This amendment, if approved, would increase the permitted acreage by 1,380 acres for a total of 1,700 acres under permit, with approximately 650 acres to be disturbed.

D. Land Status

Lands involved in this expansion are BLM-managed federal lands. CLI has located mining claims covering the area proposed for the expansion. Grazing leases overlap some of the area proposed for expansion. In addition, the BLM has issued a Right-of-Way (M-59955, March 26, 1984) to the National Guard for use of the lands for training purposes. The entire expansion area as well as the existing operation are included in the National Guard's Right-of-Way. However, the plant site is on private land owned by CLI.

E. Public Involvement

The NEPA/MEPA process began when CLI proposed to amend its current mining plan of operations. The agencies sought public input to help identify environmental issues and concerns through the process called "scoping." Public notice of receipt of the application for amendment was placed in the Townsend Star and the Helena Independent Record newspapers on October 23, 30, and November 6, 1992. No comments were received as a result of the public notices.

In addition to public scoping, the agencies reviewed the proposal for "completeness" to ensure adequate information was contained in the proposal to complete the agencies' environmental analysis. The analysis phase of the MEPA process began after the proposal was declared "complete" by the DSL on August 18, 1993. Important issues developed during this process are summarized below:

1. Vegetation

a. Rare Plants and Communities

Threatened, endangered and sensitive plant species and communities may be present in the proposed disturbance area. During the completeness review process, CLI conducted a rare plant and community survey and identified a substantial population of one sensitive plant species (*Townsendia spathulata*) in the project area. The proposed disturbance does not result in a significant loss of habitat because this small wildflower occurs in more locations than previously documented (Westech 1993). Therefore, this issue is not carried forward in this environmental assessment.

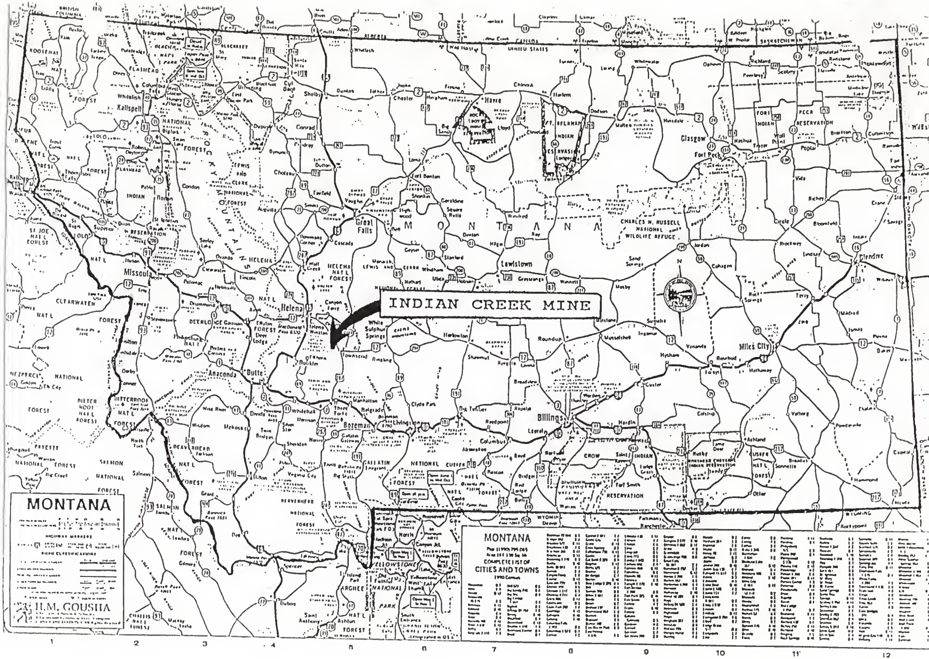

Figure 1: Site Location

b. Mountain Mahogany Community

The ability to reclaim the proposed disturbance area to mountain mahogany dominated communities was raised as an issue. The mule deer on the winter range in the area depend on the evergreen mountain mahogany shrub for high protein winter forage. If mountain mahogany could not be regrown in the area, mule deer numbers in the area would be affected.

2. Wildlife

a. Rare Animals

Threatened, endangered, and sensitive animal species may be present in the proposed disturbance area. During the completeness review process, CLI conducted a baseline rare animal survey. No sensitive animal species were found in the baseline survey (Westech 1993a). CLI has committed to further wildlife studies to be completed every 5 years. This survey and commitment minimize the potential for rare animals to be impacted; thus this issue is not carried forward for further review in this environmental assessment.

b. Mule Deer

Mule deer use on the winter range in the proposed disturbance area was identified by the agencies as an important issue that needed to be analyzed in the environmental assessment. Potential cumulative effects of the National Guard use of the winter range also need to be analyzed.

3. Surface Water Hydrology

a. Stormwater Runoff Control

The reject fines material generated from the mining of the proposed amendment area would be deposited in the mouth of a small ephemeral drainage. Therefore, questions have been raised regarding whether or not during large storm events, impounded water could pose a threat to the stability of the waste pile, and could contribute to unexpected discharges of water and sediment to Indian Creek. CLI has received a stormwater permit from the Montana Department of Health and Environmental Sciences (DHES) and has presented additional information on Best Management Practices for sediment and erosion control in the completeness review process. As a result, the approved plans and additional data have documented that runoff control problems have been minimized. Therefore, this issue will not be considered in greater detail throughout the environmental assessment.

b. Water Quality

Kiln dust from cement quarries have produced water quality problems at several sites in the US. The issue of lime kiln dust and its effects on water quality was raised as a potential issue. Potential problems with kiln dust include heavy metal contamination and increases in the pH of water above water quality standards. Analyses of lime kiln dust supplied by CLI have shown that lime kiln dust at the Townsend plant does not contain any heavy metal constituents of concern like cement kiln dust.

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Water quality pH sampling at several cement plants have shown pH values as high as 11-13. Lime kiln dust produces the same effect when combined with water. Review of the sites where the water quality problems have occurred indicate the presence of a shallow groundwater table. Fortunately at CLI, groundwater and surface water sources are limited. CLI has committed to surface and groundwater monitoring to document that surface and groundwater impacts can be identified. DSL has decided that the chance of water quality impacts from kiln dust deposition at CLI are minimal. Therefore, the issue is not carried forward in the environmental assessment.

4. Socioeconomics

If Continental Lime, Inc. is not granted this expansion, the expected remaining mine life is estimated at 5 years. Mine closure would impact employment and the overall level of economic activity in the Townsend area. This is an important issue to CLI as well as the Broadwater County economy.

5. Safety

The National Guard has used the area as a training range since approximately 1958. An inventory of the area has documented the presence of unexploded ordnance in the area of the proposed mining. CLI and the National Guard have coordinated schedules to minimize potential operating conflicts with existing operations. CLI has committed to update plans with the National Guard yearly.

This application proposes mining south into areas impacted by the National Guard training range. This impacted area overlaps CLI's claims and is known to be contaminated with unexploded ordnance. Some of the proposed areas to be mined are also within the active firing ranges of current and proposed weapons systems. Increasing the area of "joint use" overlap, could pose liability and operational problems for both parties. Currently, CLI, the BLM and the MTARNG are working on alleviating any potential conflicts arising from this multiple use.

The BLM has minerals management responsibility for all federal lands and mine permitting authority on BLM lands. The BLM regulates National Guard use in the area by a right-of-way agreement. Because of the overlap of existing land uses, safety issues, and possible liability issues, the BLM, under its statutes will resolve the legal issues. This issue is outside the scope of this analysis. Based on the outcome of the BLM decisions, DSL must attach a condition to the permit to address possible safety and liability issues.

6. Cultural Resources

Issues regarding the adequacy of the cultural resource survey baseline exist. This will be resolved by the BLM consistent with the National Historic Preservation Act as amended and other regulations which preclude unmitigated significant impacts to these resources. Therefore, this issue is outside the scope of the analysis. Based on the outcome of the BLM analysis, DSL must add a condition to the operating permit to address the cultural resource.

F. Agency Responsibilities

The DSL and the BLM initially conducted a joint review of this proposal. The National Guard and CLI use of the same area has produced a possible complicated liability issue that precludes continuation of the joint process.

Once, DSL has determined the application complete under MMRA, it must proceed with an adequacy review under MMRA and MEPA. The BLM is not bound to these procedures. Under, BLM's broad authority to manage uses of federal lands, additional safety and land use information is necessary for BLM decisions. These issues are not normally a major focus of the application review process, but because of the historical use of the area as a military training site, they are an important aspect of the BLM's responsibility as a land management agency. The following is a description of agencies responsibilities.

1. Department of State Lands

The Commissioner of State Lands must decide whether to approve the application as proposed, approve with modified mining or reclamation plan, or deny the permit, as required by the Montana Metal Mine Reclamation Act Title 82, Chapter 4, Part 3, MCA.

The DSL administers the MMRA which applies to state, federal, and private lands. The purpose of the act is to provide that the usefulness, productivity, and scenic values of all lands and surface waters involved in mining and exploration receive the greatest reasonable degree of protection and reclamation to beneficial use. The act and its regulations (ARM 26.4.101 et seq.) set forth the steps to be taken in the issuance of an operating permit for and the reclamation of the applicant's proposed mine expansion. The act applies to private, federal and state lands within Montana.

DSL's rules (ARM 26.2.601 et seq.) implementing the Montana Environmental Policy Act (Title 75, Chapter 1, MCA) also require preparation of an environmental assessment (EA). This EA has several purposes:

a. It serves to ensure that the agency uses the natural and social sciences in the environmental design arts in planning and decision-making;

b. It assists in the evaluation of reasonable alternatives and the development of conditions, stipulations or modifications to be made a part of a proposed action;

c. It determines the need to prepare an EIS through an initial evaluation and determination of the significance of impacts associated with a proposed action;

d. It ensures the fullest appropriate opportunity for public review and comment on proposed actions, including alternatives and planned mitigation, where the residual impacts do not warrant an EIS; and

e. It examines and documents the effects of a proposed action on the quality of the human environment, and provides the basis for public review and comment.

The Commissioner may deny a permit only when it can be demonstrated that air and water statutes cannot be complied with and/or the reclamation plan as proposed is not feasible (82-4-351, MCA). A permit may also be denied if a person, or any firm or business association of which that person was a principal or controlling member has a bond forfeited (82-4-360, MCA) or for failure to reclaim an operation (82-4-341(6), MCA). Continental Lime, Inc. has not forfeited any bonds under the MMRA and has not failed in its reclamation obligations.

2. Bureau of Land Management

The BLM has broad authority for the management of Federal Lands and is also responsible for the evaluation and regulation of mineral activities on Federal Lands. BLM evaluates the activity through the National Environmental Policy Act of 1969, Federal Land Policy Management Act of 1976 (FLPMA) and in this case, BLM's Headwaters Resource Area Management Plan. BLM uses the 43 CFR 3809 regulations in preventing unnecessary or undue degradation of the public lands with respect to locatable mineral activities. Federal regulation 43 CFR 3809.3-1 provides for a joint federal-state regulatory program. Such a program was initiated May 9, 1984, by a MOU between the BLM and DSL. This agreement allows for joint agency analysis of the NEPA process as described in 1 (a-e) under DSL responsibilities.

3. Other State Agencies

a. Department of Fish, Wildlife and Parks (FWP)

The Department of Fish, Wildlife and Parks is responsible for the stewardship of the aquatic, wildlife, and recreational resources of the state. Wildlife experts from FWP have reviewed the CLI application and will comment on DSL's conclusions in the EA.

b. State Historic Preservation Office (SHPO)

The SHPO is responsible for cooperating with and advising the DSL and the BLM when potentially valuable historical, archaeological, or other cultural resources are located within a project area (Montana Antiquities Act Sections 22-3-401 through 22-3-442, MCA, and the National Historic Preservation Act [P.L. 89-665 as amended and re-authorized E.O. 11593]). Advice given to DSL may include comments on an applicant's plan for impact mitigation of sites eligible for nomination to the National Register of Historic Places. This office also reviews the EA or EIS to ensure compliance with cultural regulations.

The SHPO issues antiquities permits for projects on state lands. The office also seeks determinations from the Keeper of the National Register for sites believed eligible for listing on the National Register of Historic Places. During mine operation, the DSL and the BLM are responsible for monitoring compliance with historic preservation and monitoring plans.

c. Department of Health and Environmental Sciences (DHES)

(1) Air Quality Bureau (AQB)

The AQB of DHES administers the Clean Air Act of Montana (Title 75, Chapter 2, MCA). Any proposed project with potential to emit more than 25 tons per year of any pollutant must obtain an air quality permit before construction. The applicant must apply Best Available Control Technology (BACT) to each emission source. The applicant must also demonstrate that the project would not violate Montana or Federal Ambient Air Quality Standards. At present, Continental Lime, Inc. holds a valid air quality permit.

(2) Water Quality Bureau (WQB)

The WQB of DHES is responsible for administration of the Montana Water Quality Act (Title 75, Chapter 5, MCA), providing for the classification of surface waters, establishing surface water quality standards, and administering permit programs to control the discharge of pollutants into state waters.

A Montana Pollutant Discharge Elimination System (MPDES) permit must be obtained before any discharge to surface water may occur. The MPDES permit contains water quality limitations and requires self-monitoring of effluent by the permittee. Mining operations must also comply with Montana groundwater standards. Continental Lime, Inc. has a Montana Storm Water permit for both the mill and quarry sites which addresses the management and control of storm water related discharges.

4. Other Federal Agencies

a. U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service (USFWS) administers the Endangered Species Act (ESA) and the Bald Eagle Protection Act. To comply with the ESA the BLM must prepare a Biological Evaluation to determine impacts, if any, which would adversely affect threatened and endangered species. If it is determined adverse effects may occur, the BLM would consult with the USFWS to design measures to protect the affected species.

CHAPTER II - PROPOSED PLAN AND ALTERNATIVES

This chapter summarizes the proposed CLI's Life-of-Mine (LOM) plan and expansion as modified during the completeness process. This Environmental Assessment evaluates the company's proposed expansion plan and the "No-Action" alternative.

A. Company's Proposed Plan

The area proposed for expansion is an extension of their existing permit area for 2 miles to the south, and encompasses approximately 1,380 additional acres (Figure 2). If approved, this expansion would bring the total area under permit to approximately 1,700 acres, of which approximately 633 acres would be disturbed. Table 1 provides a summary of projected permit and disturbance acreage. Expected mine life would be extended for approximately 50 years. In the expansion area, 270 acres would be designated as new mine pit area, while approximately 235 acres would be used for waste rock and reject dump expansion.

TABLE 1: Existing and Proposed Disturbed and Permit Acreages

	Existing Disturbed	Proposed Disturbed	Total
Plant Site	11	0	17
Pits	76	270	346
Waste Dumps	11	235	246
Roads, Soil Stockpiles, Other	12	12	24
TOTAL	114	519	633

Note: All acreages are approximate.

Continental Lime, Inc. proposes to submit detailed development plans in 5-year increments for agency review. The plans would finalize more areas to be mined, road locations, expected waste rock volumes and their disposition, soil salvage, and updated reclamation plans for previously disturbed areas. The reviews would enable the agencies and CLI to amend and modify the operation and reclamation plans to take full advantage of new information and unexpected conditions, and to comply with the purpose and intent of applicable environmental laws.

1. Mine Plan

CLI proposes to mine up to 1,000,000 tons (741,000 cy) of limestone per year, while generating 766,000 tons (415,000 cy) of waste rock and 16,500 tons of kiln dust per year.

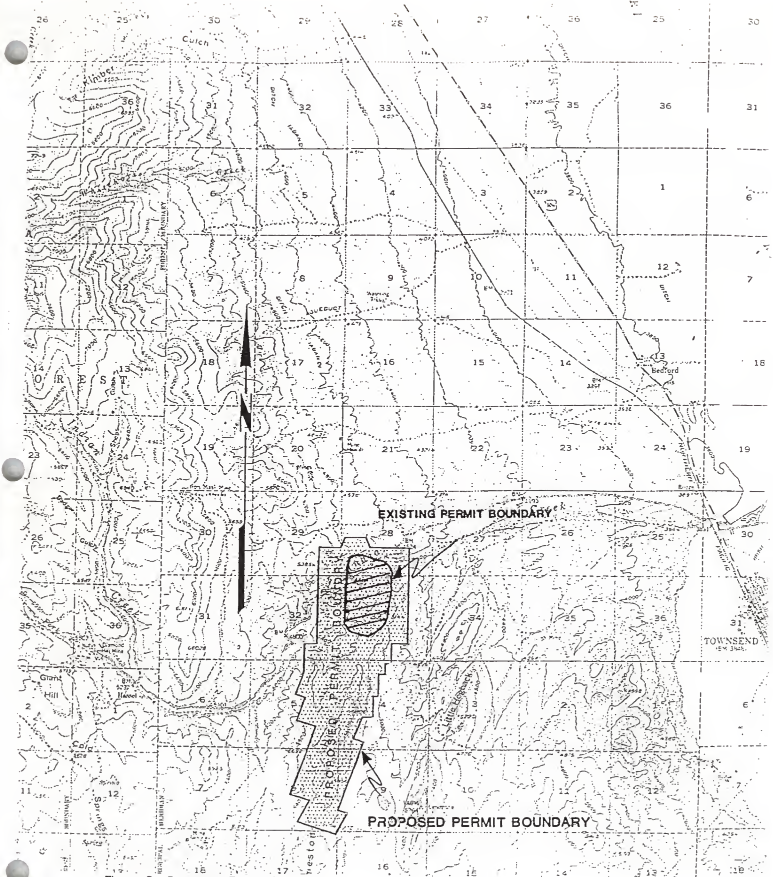

Figure 2: Proposed Expansion Area

Mining of the limestone deposit would commence using typical open pit/quarry techniques wherein the limestone is removed in layers, leaving 20-foot wide benches spaced every 20 feet to 60 feet vertically. The mine area would not result in a classically shaped pit, but would be more of a sidehill cut with a west-facing aspect. The 20- to 60-foot high bench faces would be back-sloped from 5 to 15 degrees. The ridge would be reduced 100-160 feet. Access and haul roads into the active mine area would be strategically placed to compliment ore production. These roads would tie in to the existing road network.

Prior to any disturbance, soil would be collected and stockpiled for use during reclamation. Following soil removal, any overburden or waste rock encountered would be transported to the waste rock dump. Up to 50 percent of the waste rock would be backfilled to an inactive part of the mine area. Waste rock disposal is estimated at 30.6 million tons (16.6 mcy) over the life of the mine in waste rock dumps.

Following overburden removal, the ore-grade limestone would be drilled, blasted, and transported to a crushing facility where it would be crushed prior to the actual lime production process. During the crushing of the limestone, a -1/2" waste material would be generated and deposited in the reject fines dump.

Surface water runoff during mining would be managed with a series of diversions, retention/detention ponds and control structures, draining into the mine interior where evaporation and infiltration would be the mechanisms for water dispersion. Other stormwater runoff ponds are proposed for the Indian Creek drainage area and would collect water from the haul roads and mill area. These plans are consistent with CLI's approved stormwater permit.

Continental Lime, Inc. proposes to provide the final designs of their mine development plans for 5-year mining increments. These periodic installments would precisely define expected development over the coming 5-year interval. The plans would be submitted to the agencies for review and consistency with the LOM plans previously analyzed. Modifications and changes could be incorporated during this time as the situation warranted. Existing equipment and personnel, with pre-production, mining, and ore hauling following the protocol already established and permitted at the mine would continue at their present levels. Any impacts realized as a result of changes in the plan not analyzed in the LOM plan would be subject to environmental review at the time of the change.

2. Reclamation Plan

The proposed reclamation plan would capitalize on information gathered from an existing reclamation test plot located near the plant site and other test plots established in 1993. A kiln dust dump, sloped at 2.5 horizontal to 1 vertical (2.5:1), was covered with 12 inches of soil and planted with a combination of limber pine, yucca, and mountain mahogany, along with a native grass mix. The performance of this and other test sites will aid in determining the optimum site-specific combination of soil, soil amendments, and plant species for reclamation at the mine.

The reclamation plan for the LOM expansion calls for the regrading of disturbed areas to a minimum 3:1 vertical slope. However, final slopes on waste rock dump slopes, rock outcrop areas, mine highwalls, and pre-existing road backslopes would be steeper. Existing disturbances on permitted areas are included as part of the LOM reclamation plan as well.

Specifically, the reclamation plan will include:

a. Mine Area

Backfilling of the sidehill cut (11,000 ft x 1000 ft) with approximately 50 percent of the waste and overburden material generated is proposed under the LOM plan. Pit backfilling of waste rock would not be uniform, rather waste distribution will depend more on mine development and material handling requirements at any particular time. This will however provide topographic and habitat diversity within the mine. Waste rock would be disposed in a manner to create a variety of slope types (CLI, 1993).

All waste rock slopes in the pit area and exposed bench tops would receive 2 to 9 inches of reject rock and soil. Some 40 foot highwalls would be left for raptor habitat. Up to 69 acres of rock outcrop type reclamation is proposed for the mine area and waste rock dumps.

b. Waste Rock Dumps

The principal waste rock dumps would be located on the west side of the mine area, and would cover approximately 150 acres. All dump faces would be graded between 2:1 to 3:1, while dump tops will be sloped at 2 percent or less. The final dump slopes would be shaped to promote surface water drainage to either the mine or existing drainages.

The reclamation plan calls for final shaping to utilize the postmine topography, boulder and slash piles, and vegetative cover to create topographic and vegetative diversity.

c. Rejects Pile

The rejects pile (-1/2" fraction) would hold approximately 18 million tons of undersized limestone material. At mine closure, this rejects pile would cover 85 acres, and would have filled a small drainage and portions of mine blocks A through G (Figure 3).

The top of the rejects pile would be graded to provide a 2 percent slope towards the face of the pile in order to promote surface water runoff. All slopes would be graded at 3:1 or less. Associated access roads across this area would be regraded to approximately 3:1 upon cessation of mining. The area would be covered with approximately 2 to 9 inches of reject rock and soil depending on proposed revegetation plan and reseeding.

d. Haul and Access Roads

Haul and access roads would be reclaimed by pulling back any downslope fill material and infilling the cut portion of the road. Regrading would establish an

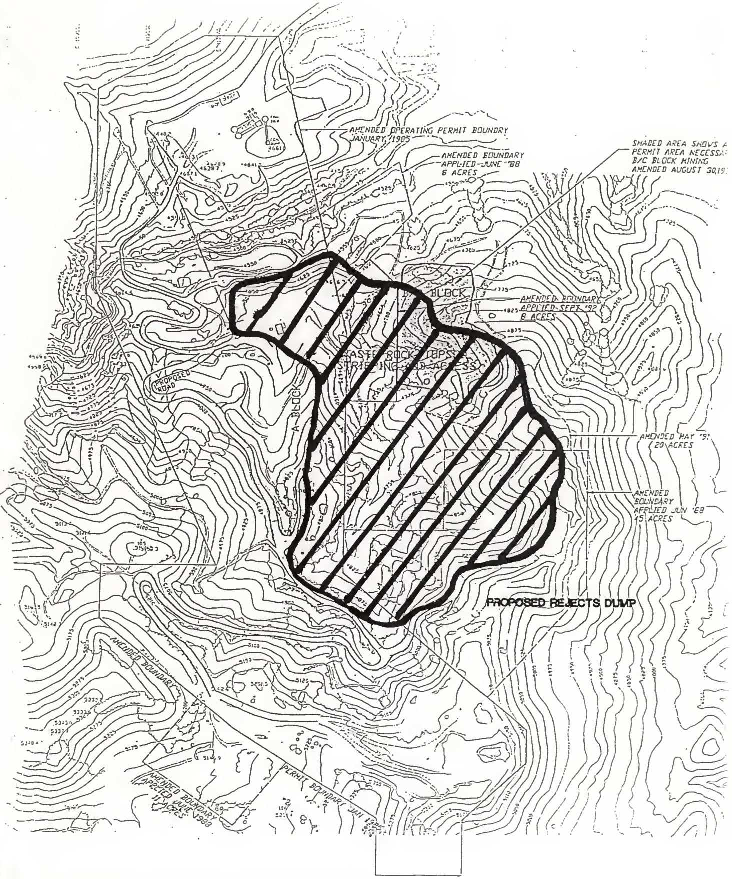

Figure 3: Proposed Rejects Dump (Not to Scale)

approximate 3:1 slope or a slope consistent with the immediately surrounding topography. Six to 9 inches of topsoil would be spread over this disturbed area, to be followed by seeding.

The main haul road would be reclaimed by reducing the road to approximately 12 feet in width. The entire disturbed road cross section would be resoiled and seeded. The reclaimed 12-foot running surface would be revegetated and would continue to provide long-term access to the southern limits of the permit area in order to assist monitoring and any necessary maintenance of the reclaimed mine area.

e. Surface Water Management

Upon reclamation, all surface water control structures will be removed and the areas of disturbance regraded, soiled and reseeded in conformance with reclamation standards outlined above. Surface water drainage would be directed towards the mine or to existing drainages.

B. Alternatives to the Proposed Plan

1. Alternative 1 - "No-Action"

Under the "no-action" alternative the Department would deny CL I's proposal for mine expansion. Consequently, CLI would continue operating under its existing permit and amendments for approximately 5 years (probable reserves remaining under present permit). Final disturbed acres at the end of mine life would be approximately 145 acres.

C. Related Actions

Other activities and environmental disturbances in the immediate area include two small placer mining operations below the CLI plant, a precious metals exploration program upstream of the facilities, and the National Guard training area.

[illegible] consistent with [illegible]
SMOG indices of [illegible]
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The [illegible]

[illegible] Surface Water Management

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CHAPTER III - AFFECTED ENVIRONMENT

This chapter presents a narrative describing those areas and resources identified in Chapter I as being potentially impacted by the proposed action. The mountain mahogany plants in the area and the extensive use of those plants by mule deer for winter forage are the principal natural resource issues. The socioeconomic impacts of mine closure on CLI and the economy of Broadwater County is an additional human environment issue.

A. Vegetation - Mountain Mahogany

The CLI mine area is located in the Limestone Hills between the Missouri River and the Elkhorn Mountains. The vegetation of the regional area has been described in the application submitted by CLI and in previous agency environmental analyses(BLM-DSL, 1993). This section will focus on one plant in the Limestone Hills area, curl-leaf mountain mahogany because:

1) mountain mahogany dominates the areas to be mined;

2) mountain mahogany is the most important food source affecting the use of the area for winter range by a large herd of mule deer from the Elkhorn Mountains; and

3) the chance of reestablishing mountain mahogany in reclaimed mine disturbances has been questioned.

1. Plant Description

Mountain mahogany is an upright evergreen shrub, usually 3-15 feet tall. The common name, curl-leaf mountain mahogany, refers to the rolled under edges of the leaves, the mountainous areas in which the plants grow and the very hard and often reddish brown wood which resembles the tropical, american, mahogany tree. The scientific name for curl-leaf mountain mahogany is _Cercocarpus ledifolius_.

Curl-leaf mountain mahogany is one of the few evergreen shrubs not related to the common evergreen plants like pines, spruces, firs, junipers, etc. The leaves are leathery, green, and shiny on top and whitish and hairy underneath. The leaves eventually fall off the shrub when they are two years old. Because the leaves stay on the plant through the first winter, browsing animals are able to use the high quality forage. Research has found that the crude protein content of mountain mahogany leaves is 9.5%-10.5% and use by animals ranged from November to mid-February (Duncan 1975).

Use of the plant by deer would vary depending on the severity of the winter. FWP studies in the mine area showed that deer would eat over 50 percent of the past years growth each winter. This heavy use produces plants with dense branching patterns resembling pruned hedge plants.

2. Range of the Plant

Curl-leaf mountain mahogany occurs in scattered stands throughout the southwestern portion of Montana, west of a line extending roughly from the Madison and

Bridger Ranges, north through Canyon Ferry Lake and south of a line from Helena to Missoula. The plant is also found extending northward from Wyoming into south-central Montana along the Bighorn and Little Bighorn Rivers, south of a line from Lodge Grass to Yellowtail Dam (see Figure 4 from Duncan 1975). The highest concentrations of stands in Montana occurs east of the Continental Divide in Beaverhead County.

Locally, mountain mahogany occurs primarily in patch like stands. Large, continuous stands are rare. This reflects the plant's adaptation to growing mainly on:

1) shallow and rocky soils less than 6 inches deep;

2) cliffs and ledges on warm and dry exposures (mainly southwest, southeast and northwest);

3) rocky ridges and steep slopes which are largely steeper than 30 percent (Duncan 1975).

3. Mountain Mahogany in the Limestone Hills

The mountain mahogany plants are concentrated along the limestone ridgeline that cuts the project area in half. Mountain mahogany is the dominant shrub vegetation with a grass and wildflower understory. Mountain mahogany predominates in the area because of its preference for very shallow rocky soils and limestone bedrock outcrops in the mine area. Six of 21 mountain mahogany sites studied in southwestern Montana had bedrock slabs exposed with mountain mahogany plants growing in the cracks in the rocks (Duncan 1975).

Topography, elevation and the mountain mahogany vegetation in the Limestone Hills have created an area highly preferred by mule deer for winter range. Because limestone is the target product to be mined, the area dominated by mountain mahogany would be the most disturbed area within the project boundary.

Historically, wildfires generated as a result of National Guard training activities have burned large portions of the plant communities in the Limestone Hills area. This has reduced the overall quantity of forage available for animals that eat shrubs. Mountain mahogany to this date has not reestablished on the burn sites in any quantity.

Noxious weeds have increased in the proposed area to be mined as well as in other areas of Broadwater County since the original plant inventories were conducted in 1981 (ECON 1981). Noxious weeds are present along access roads and are spreading throughout the proposed mine area on disturbed as well as on undisturbed land. Five noxious weed species in the area have the potential to spread on to disturbed and undisturbed areas. CLI has implemented a weed control program and sprayed twice in 1993. This spread of noxious weeds may be an important factor in reducing the potential of the reclaimed sites to grow desirable wildlife forage.

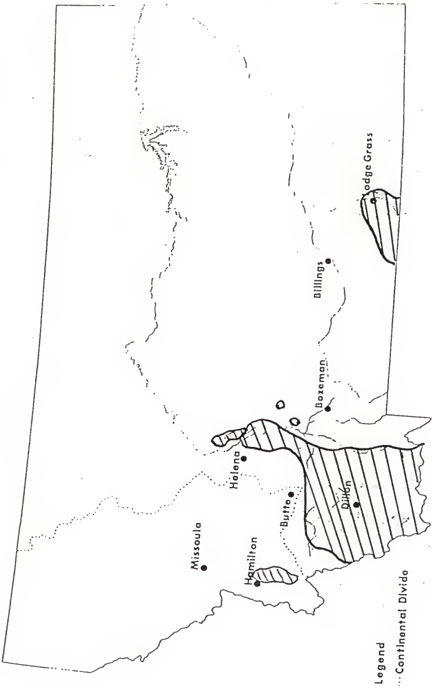

Figure 4: General Distribution of Curl-leaf Mountain Mahogany in Montana

B. Wildlife

1. Mule Deer

Mule deer is the primary big game species occurring in this area. There are three winter range survey areas in the Limestone Hills, the major winter range for mule deer associated with the eastern central portion of the Elkhorn Mountains. Unit B is the central portion of three units designated for mule deer winter range and it contains 11,581 acres. The proposed mine expansion area lies within this unit (Figure 5).

The Limestone Hills contain a unique combination of elevation, topography and vegetation which make it attractive to mule deer. The winter range area varies from 4,000-6,000 feet in elevation. The Elkhorn Mountains to the east range all the way up to 9,000 feet. The Limestone Hills are dry because of their location in the rain shadow on the east side of the Elkhorn Mountains. The uplifted limestone in the area produces steep slopes with shallow soils which favor the growth of mountain mahogany. The dry conditions of the area, sunny exposures, and moderate elevations limit snowfall. In addition, the windy exposed ridges and upright, evergreen growth form of mountain mahogany, allow for access to quality forage for mule deer even in severe winter storms.

In 1991, 73 percent of 2,358 mule deer were found in Unit B during winter wildlife surveys by the Montana Dept. of Fish, Wildlife and Parks (FWP). Aerial surveys conducted in this area during the winter of 1993 indicated a total of 1,003 deer wintering here (MDFWP unpubl. data). In 1993, 88 percent of the deer observed were in unit B. There are approximately 1,111 acres of mountain mahogany habitat in Unit B (Westech, 1993).

Mule deer have been observed using east facing slopes in the proposed mine area. Heavier use of the west facing slopes has been observed farther south in the main part of the Unit B winter range. The largest part of the proposed mine disturbance would be on the west side of the limestone ridge.

Mule deer use over 50 percent of the past year's growth of mountain mahogany as shown in studies conducted for a master's thesis in 1973-1974 (Duncan 1975), as well as by FWP studies. Browse transects of the area were read for 6-10 years prior to the 1973-1974 studies. Stands of mountain mahogany show good vigor and all age groups of plants are represented. Evidently, the site has not reached carrying capacity or the site has not been subjected to overbrowsing as the last few winters in the area have not been severe. No data has been generated on the carrying capacity of the winter range.

While the Limestone Hills represent primarily winter range, there is a low density of mule deer that use this area as year round habitat.

C. Socioeconomics

Continental Lime, Inc. began operations at its Indian Creek mine and mill site in 1981. Since that time it has expanded to include approximately 50 employees at the present time, making it one of the larger employers in Broadwater County. As many of the mine and mill personnel live in and around Townsend (pop. 3500, 1990 census), they make a significant contribution to the local economy by utilizing basic goods and services.

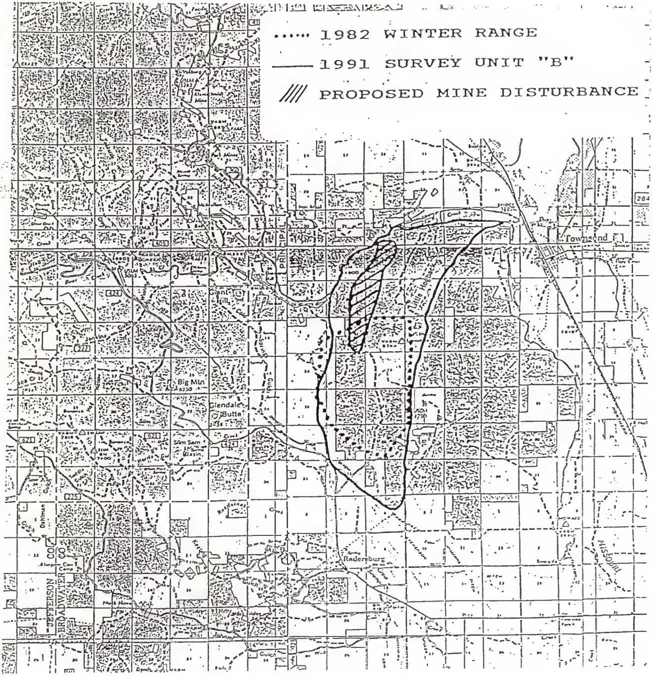

Figure 5: Mule Deer Winter Range in Vicinity of Mine

In 1992, Broadwater County collected approximately $3.4 million dollars in tax revenue from all sources. Continental Lime, Inc. paid over $665,000 (20 percent of total county tax revenue) in taxes during fiscal 1992.

CHAPTER IV - ENVIRONMENTAL CONSEQUENCES AND CUMULATIVE EFFECTS

This chapter discloses the potential effects of the alternatives disclosed in Chapter 2, the impacts on the resources described in Chapter 3, and forms the analytical basis for the comparison of alternatives in Chapter 5. As identified in Chapter 1, the mountain mahogany vegetation, mule deer winter range, and potential socioeconomic issues could have important impacts associated with the proposed action.

Long term planning by Continental Lime, Inc. at their Indian Creek plant has resulted in a proposal to expand the present operation which would result in disturbing a total of 650 acres as part of a "Life-of-Mine" expansion. Other land use and related environmental disturbances in the immediate area include two small placer mining operations below the CLI plant, an exploration program for precious metals upstream of the facilities and the continued use of the surrounding area by the Montana National Guard for training. This chapter will address how collectively these other activities could additionally impact the issues of vegetation, wildlife and socioeconomic issues.

A. Proposed Action

1. Vegetation

a. Mountain Mahogany

This existing mine has affected over 100 acres of the existing vegetation. Approximately 29 percent of the original permit boundary area was dominated by mountain mahogany. CLI estimates that the proposed action could disturb up to 6 percent of the total mule deer winter range acreage. CLI also estimates that 14-36 percent of the plant cover in the winter range is dominated by mountain mahogany. Over 106 acres of mountain mahogany vegetation or almost 10 percent of the total mountain mahogany in the winter range would be removed by mining over the next 50 years.

The mountain mahogany communities has developed on the weathering limestone outcrops over the last 10,000 years. The ridgeline is an erosional feature. If this erosional feature is modified to a site where soil accumulates, then the long term vegetation community would change. The proposed mining activity does not remove the limestone outcrops but completely disturbs and reshapes them. The shape and appearance of a reclaimed mine area cannot be completely returned to pre-mine patterns but can be approximated to facilitate reestablishment of mountain mahogany. What is needed, is to create a post-mine environment recreating of steep limestone outcrops with small amounts of soil. DSL feels that this is the key to recreating a post-mine environment that will ensure that mountain mahogany will not only survive when seeded or planted but it will also be able to reproduce and regenerate the pre-mine plant densities over time.

CLI has proposed reestablishment of mountain mahogany as well as other shrubs in their post-mine reclaimed communities. Shrubs can be planted initially by seed or as seedlings or transplants and they may survive and flourish, but they may not reproduce. Fires resulting from National Guard activities have consumed additional acreage of mountain mahogany vegetation in the surrounding area which has not returned to pre-burn densities and productivity. Reestablishment to premine densities of almost 5000 plants/acre may take a long time.

Over 20 years of shrub establishment practices in the western United States, particularly in the coal mining regions of Montana and Wyoming have been reviewed (MSU, 1993). To date, shrubs have not been successfully established to premining densities on reclaimed coal mining areas. The coal mining areas have failed to establish shrubs because of the lack of recreating site conditions that promote shrub growth. Factors that have limited shrub success include too much emphasis on replacing homogenous deep soils, too gentle slopes to limit erosion, too much grass competition, and lack of flexibility in the regulations for alternative shrub establishment strategies.

In addition to physical site conditions, heavy predation of shrubs by large populations of deer and antelope on coal mine sites have added to shrub failures. Animal control programs using repellents and plant covers have failed. Fencing is not practical. Hunting programs have been limited by liability concerns on mine property. DSL has observed similar problems with deer predation on hard rock mining sites in Montana.

The mining method at CLI produces a mine that is a series of benches resulting in a sidehill cut rather than a true pit. These sidehill cuts lend themselves to partial backfilling with waste rock economically for the mine operator. This partial backfilling would help recreate a variety of slopes from vertical walls on some mine cuts to slopes that vary from angle of repose 1 1/2:1 or 65 percent to 3:1 or 33 percent.

CLI has presented a reclamation plan that they think would produce mountain mahogany habitat. CLI does not believe that shrub establishment will be a problem at the mine area. They have established a series of test plots to prove their contention. To date, two year old seedlings, even though heavily browsed by deer have survived. CLI proposes to plant 400 shrubs per acre. CLI would use deer repellent and plant covers for two years to protect seedlings. If excessive browsing cannot be stopped, then fencing and deer population management through hunting would be considered.

2. Wildlife

a. Mule Deer

Despite the existing disturbance to their historic winter range by mining, mule deer, especially those utilizing mountain mahogany, have been observed in the mine area seemingly unaffected by mining activities. In fact, they concentrate on the mine area during hunting season (Chorney, personal communication). FWP personnel contend that this is an unnatural concentration of deer that could lead to disease or other animal health problems.

The use of the surrounding area for livestock grazing and recreation has imposed additional pressures on native wildlife. The mine area vegetation is better suited to wildlife browse and domestic sheep production than to cattle grazing. The vegetation has been rated as capable of supporting enough forage for 39 cattle for one month on 640 acres (ECON, 1981). The considerable road development in the area has changed the character and access of the winter range forage by creating disturbance corridors through the browse areas.

The size of the proposed project at approximately 650 disturbed acres represents over 1 square mile of wildlife habitat which would be lost during mine production. This

represents 6 percent of the identified mule deer winter range in Survey Unit B (See Figure 5). Although there would be a loss of some winter habitat which could affect the population, deer have demonstrated their adaptability to man-made disturbances and activities, most recently evidenced by the apparent compatibility of deer with the existing CLI operations.

Although the mine would disturb almost 650 acres over 30-50 years, CLI contends that 400 acres would be the maximum unreclaimed acreage at any one time. Although the acres would be reshaped and seeded and planted, mountain mahogany density and production would not have recovered on any acres by the end of the 50 year mine life. Consequently, at least 10 percent of the mountain mahogany would be lost to wintering mule deer for the larger part of a century.

The recent spread of noxious weeds in this part of Montana, also would limit revegetation success. Spotted knapweed and canada thistle are common along the access roads and are spreading on the current mine disturbances. CLI has initiated a control program in 1992 and 1993. Leafy spurge, whitetop and dalmatian toadflax were also present in the permit area. The presence of noxious weeds in the permit area threatens reclamation success of shrubs and wildflowers. Shrubs and wildflowers have the most forage value for mule deer.

Noxious weeds displace native species by taking sites that were formerly occupied by natives species. The presence of noxious weeds could limit the successful reproduction of mountain mahogany in the long term to levels less than those which existed before mining. This also would limit the carrying capacity of the winter range part of the reclaimed plant community.

3. Socioeconomics

An extension of 30-50 years of mining would ensure a continued important source of tax revenue for Broadwater County. CLI would continue to patronize local vendors for mine related support services, and mine personnel would continue to contribute much needed capital into the economy by their acquisition of local goods and services.

CLI would continue to generate quality lime products for Montana and the northwestern US. Mine expansion for 30-50 years would allow CLI to aggressively pursue long-term lime contracts knowing they would have the lime to mine to meet contract obligations.

CLI continues to research future markets for its waste products . Presently, lime kiln dust is being tested and used to treat acid mine wastes as part of the Superfund cleanup in the Butte-Anaconda areas. CLI is also pursuing markets for its high magnesium waste rock.

B. "No-Action Alternative"

1. Vegetation and Wildlife

The "no-action" alternative would limit the previously identified natural resources impacts to vegetation and wildlife to limits evaluated in the last expansion of mining (BLM and DSL 1993).

2. Socioeconomics

The "no-action" alternative would cause a detrimental impact to the local economy. Tax revenues would be lost and capital expenditures would be reduced. Premature mine closure may put a strain on local welfare services if out-of-work mine personnel cannot find alternative trades within a timely fashion.

CLI would be negatively impacted by premature mine closure. Contract negotiations with lime consumers would be limited because of the lack of confidence that CLI could produce the product for more than a short time frame. CLI would have a limited time in which to recover investment capital for the installation of recent mill improvements such as the second kiln and air quality cleanup equipment.

Montana would lose another productive use of one its most abundant natural resources--limestone.

C. Cumulative Effects

1. "No-Action" Alternative

Cumulative effects of the "no-action" alternative to vegetation and wildlife would be limited to levels analyzed in the last mine expansion (BLM and DSL 1993). Recent cutbacks in the logging industry has impacted the Broadwater County economy. In addition, proposed tax law revisions to address Montana budget shortfalls and school funding have placed additional property tax burdens on county landowners. Premature mine closure could add an additional burden on local taxpayers.

2. Proposed Action

a. Vegetation

Within the 500,000 acre landscape of the Elkhorn Range this action is one more project that gradually alters the character of the area vegetation. The action, in and of itself, will not alter the landscape to a great degree. However, in connection with all the projects that have occurred within the mountain range, the landscape has changed. Roads exist in a very high density throughout the range. Mining activities, historic and recent, are obvious in the area. The Montana National Guard maintains an active gunnery range adjacent to the mine area which will continue. In connection with the existing mine, this action widens the area of impact in the Limestone Hills where the disturbance occurs.

This project, in addition to the existing mine disturbance, does alter the local landscape. Approximately 100 acres do not resemble any natural landscape feature or pattern that originally existed. The mine expansion would remove up to 2 miles of the ridgeline and lower it over 100 feet. The mining does not destroy the ridgeline, but completely reshapes it. The configuration of vegetation and topography on this limestone ridge can not be rehabilitated to pre-project patterns in less than a century.

This existing mine has had an effect on the mountain mahogany community. The proposed expansion could disturb up to 650 acres of which 106 acres are dominated by mountain mahogany. Fires resulting from National Guard activities have consumed

additional acreage of mountain mahogany vegetation. Roads through the Limestone Hills do not remove a large portion of the mountain mahogany stand, but they do change the character of the stand and affect the wildlife species that use it.

b. Wildlife

The existing mine has had an impact on wildlife movements. Most obvious is the alteration of movement patterns to mule deer that use this area as a migration route and winter range. Habitat to the south of the project is suitable to absorb species movements and provide a route between or among habitats blocked because of these activities.

The mine area has become a refuge for mule deer during the hunting season. In addition, National Guard training exercises in the area in the winter add an additional stress to mule deer. Consequently, the mine area may provide a relative stress free environment from pressures related to other activities. In contrast, this use as a refuge could result in health effects to the mule deer herd from diseases.

Other disturbances to wildlife and wildlife habitats occurs in the area from a variety of sources. The National Guard firing range adjacent to the proposed project area has negatively impacted wildlife habitat through unplanned fires and direct destruction of habitat by military activities without reclamation. Furthermore the National Guard is applying for withdrawal of the firing range which is currently under the Bureau of Land Management jurisdiction and future management of that area is uncertain. If withdrawal occurs and habitats are further degraded the area adjacent to the firing range would likely become more valuable as wildlife habitat, particularly to mule deer as winter range.

Human development on the form of housing developments is slowly encroaching on the Limestone Hills area along the Missouri River and adjacent to the Indian Creek road. All these factors combined serve to gradually decrease the size and value of this area as winter range to mule deer.

Other mineral exploration activity near Diamond and Giant Hill approximately 3 miles to the west is occurring. These operations have been exploratory in nature and impacts to big game have been negligible. If these operations reached the development stage their effect on big game would be of a greater magnitude.

This proposal is expected to have an impact on mule deer, and if the above mentioned activities come about, their cumulative impacts are expected to have an even greater impact on mule deer. Maximum habitat loss out of Survey Unit B is estimated at 6 percent. Mountain mahogany loss is estimated at 10 percent. However, post-mine reclamation revegetation programs would attempt to replace the majority of the disturbed habitat to pre-mine conditions. In fact, CLI has proposed replacing up to 157 acres of mountain mahogany habitat instead of the 106 acres that existed before mining.

The habitat area loss could result in a subsequent long-term reduction in winter habitat quantity and quality of forage. Readily available alternative food sources may be available for some of the mule deer. Assuming, revegetation to mountain mahogany could take up to a century to recover or it may never recover to pre-mine densities, this mine expansion could permanently remove 10 percent of the deer habitat use in the current survey unit B winter range.

c. Socioeconomics

The mine expansion coupled with other activities in the area would have a net positive effect on the socioeconomics of the greater Townsend area. The local real estate market has been flourishing with reduced interest rates. Townsend has been attracting retired out-of-state people who can live more cheaply in Townsend than in their out-of-state residences and who enjoy the abundant recreational opportunities in the area. In addition, Townsend has become a bedroom community for Helena workers. Several small businesses have been attracted to the area trying to develop uses for waste wood products. The service industry is growing trying to cater to the increased number of people living in the area.

Continued mine expansion would provide a stable source of revenue for county government to maintain services to an expanding economy.

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CHAPTER V - CONCLUSIONS

The environmental effects of mining and related activities on the above resources in and around CLI's mine and facilities have in part been analyzed as part of the original permit (DSL, 1981) and in a recent minor mine expansion (DSL, 1993). This review of the proposed expansion of Continental Lime's Indian Creek mining operations has identified three areas of potential impact: effects on mountain mahogany vegetation and the resultant impacts to mule deer winter range; and socioeconomics. An environmental review and analysis has determined that there would be impacts associated with the mine expansion on these resources.

Approval of the Life-of Mine (LOM) expansion (Proposed Plan) and denial of the expansion are the only alternatives presented. In denying the expansion, the existing operation would remain at its present level of permitted disturbance, and there would be no additional impacts to vegetation or wildlife, either in or adjacent to the area of proposed expansion. However, there could be a significant impact to the local economy should the mine close. In addition to the loss of payroll and vendor income, tax revenues would be lost. Tax revenues provided by CLI in 1992 represented 20% of the total taxes collected in Broadwater County. The approval of the expansion would result in a stable source of economic activity for Broadwater County for 30-50 years.

Approval of the LOM plan could result in the loss of 10 percent of the mule deer winter range forage base and a long term reduction in the quantity and quality of winter range habitat in the expansion area. Ninety percent of deer habitat would maintain the current deer herd at more than an adequate level to ensure their continued existence in the area. In addition, mule deer have shown their ability to adapt to man's activities, including mining, in the area.

As a result of the analyses on the human and natural resources, DSL has concluded that the proposed mine expansion and the potential loss of up to 10 percent of the mule deer habitat in the mine area does not represent a significant environmental impact, and the preparation of an Environmental Impact Statement is not recommended.

Two stipulations to be attached to permit approval have been identified in the environmental assessment:

1) National Guard safety and possible liability issues must be resolved between BLM and CLI before mining begins.

2) Cultural resource clearance must be resolved before any sites are mined.

If resolution of any of the permit stipulations results in a modification of the plan in this EA, a subsequent environmental analyses may be needed.

GLOSSARY

AQB	Air Quality Bureau, Department of Health and Environmental Sciences
CLI	Continental Lime, Inc.
Degradation	The increase in concentration of certain regulated substances above ambient (background) levels, and may only be allowed by the BHES based on necessary social and economic concerns.
DHES	Montana Department of Health and Environmental Sciences
DNRC	Montana Department of Natural Resources and Conservation
DSL	Montana Department of State Lands
EA	Environmental Assessment - an environmental document of a proposed action and its effects on the environment
EIS	Environmental Impact Statement - a comprehensive environmental document delineating a proposed action's effects on natural and human environment. An EIS gives an in-depth look at specific issues and cumulative effects in an area. Required by the federal National Environmental Policy Act (NEPA) and the Montana Environmental Policy Act (MEPA)
FWP	Montana Department of Fish, Wildlife and Parks
HRB	Hard Rock Bureau of the Department of State Lands
LOM	Life of Mine Expansion Application
MMRA	Montana Metal Mine Reclamation Act
PER	Preliminary Environmental Review
pH	Measure of the acidity or alkalinity; 7 is neutral, low numbers are acidic; high numbers are basic.
WQB	Water Quality Bureau, Department of Health and Environmental Sciences

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